

CLAIMS

What is claimed is:

1. A pipeline communication system, comprising:
a pipeline having a first surface extending along at least a portion of a length of the pipeline;
a conductive bus formed to and extending along a portion of the first surface of the pipeline;
a transmitter operably coupled to the conductive bus for sending information along; and
a receiver operable coupled to the conductive bus for receiving the information therefrom.
2. The pipeline communication system of claim 1, wherein the conductive bus comprises a plurality of conductive traces, each of the traces conformally fabricated to the surface of the pipeline.
3. The pipeline communication system of claim 2, wherein the plurality of conductive traces comprise thermally sprayed, electrically conductive material.
4. The pipeline communication system of claim 2, wherein the conductive bus further comprises a first insulative layer formed between the surface of the pipeline and the plurality of conductive traces, the first insulative layer located to electrically isolate the plurality of conductive traces from the surface of the pipeline.
5. The pipeline communication system of claim 4, further comprising a bonding layer coupled between the surface and the first insulative layer, the bonding layer configured to planarize the surface before coupling the conductive bus thereto.
6. The pipeline communication system of claim 4, wherein the conductive bus further comprises a second insulative layer formed over the plurality of conductive traces, the second insulative layer located to physically protect and electrically insulate the plurality of conductive traces.

7. The pipeline communication system of claim 1, wherein the surface of the pipeline is an exterior surface.

8. The pipeline communication system of claim 1, wherein the surface of the pipeline is an interior surface.

9. The pipeline communication system of claim 1, wherein the transmitter and receiver are configured for communication according to a serial bus protocol utilizing the conductive bus for communicating therebetween according to the serial bus protocol.

10. The pipeline communication system of claim 9, wherein the serial bus protocol is configured according to an RS-485 protocol.

11. A pipeline communication bus, comprising:
a conductive bus including a first conductive trace and a second conductive trace, the first and second conductive traces adapted to conformally couple with a pipeline at a first surface extending along at least a portion of the length of the pipeline;
a transmitter interface adapted to operably send information along the conductive bus; and
a receiver interface adapted to operably receive information along the conductive bus.

12. The pipeline communication bus of claim 11, wherein the conductive bus, the transmitter interface and the receiver interface are configured according to a serial bus protocol utilizing the conductive bus for communicating between the transmitter and receiver interfaces according to the serial bus protocol.

13. The pipeline communication bus of claim 11, wherein the first and second conductive traces are comprised of thermally sprayed, electrically conductive material.

14. The pipeline communication bus of claim 11, wherein the conductive bus further comprises a first insulative layer formed between the surface of the pipeline and the first and second conductive traces, the first insulative layer located to electrically isolate the first and second conductive traces from the surface of the pipeline.

15. The pipeline communication bus of claim 14, wherein the conductive bus further comprises a second insulative layer formed over the first and second conductive traces, the second insulative layer located to physically protect and electrically insulate the first and second conductive traces.

16. A method of communicating along a pipeline, comprising:
forming a plurality of conductive traces conformally coupled to a pipeline at a surface extending along at least a portion of the length of the pipeline;
transmitting information along the plurality of conductive traces; and
receiving the information from the plurality of conductive traces.

17. The method of claim 16, wherein the transmitting information and the receiving information further comprises transmitting and receiving according to a serial bus protocol utilizing the plurality of conductive traces for communicating between the transmitter and receiver interfaces according to the serial bus protocol.

18. The method of claim 16, wherein forming a plurality of conductive traces comprises thermally spraying electrically conductive material on the first surface of the pipeline to form the plurality of conductive traces.

19. The method of claim 18, further comprising forming a first insulative layer between the first surface of the pipeline and the plurality of conductive traces, the first insulative layer located to electrically isolate the plurality of conductive traces from the surface of the pipeline.

20. The method of claim 19, further comprising forming a second insulative layer over the plurality of conductive traces, the second insulative layer located to physically protect and electrically insulate the plurality of conductive traces.

21. The method of claim 16, wherein the forming a plurality of conductive traces further comprises forming the plurality of conductive traces on the surface, wherein the surface is an exterior surface of the pipeline.

22. The method of claim 16, wherein the forming a plurality of conductive traces further comprises forming the plurality of conductive traces on the surface, wherein the surface is an interior surface of the pipeline.